WHAT IS CLAIMED IS:

1.   A narrowband interference cancellation system comprising:

a narrowband processing component configured to receive a signal and identify one or more narrowband interferers in the received signal, the narrowband processing component including a filter bank configured to separate the received signal into a predetermined number of channel bands;

a wide band processing component coupled to receive both real and quadrature components of the received signal, the wide band processing component configured to provide an average level for an unfiltered version of the received signal;

a soft decision metric generator coupled to both the narrowband processing component and the wide band processing component, the soft decision metric generator configured to produce metrics based on predetermined thresholds; and

a filter component configured to receive coefficients from the soft decision metric generator, the filter component configured to cancel the one or more narrowband interferers.

2.   The narrowband interference cancellation system of claim 1 wherein the filter bank is coupled to a plurality of magnitude estimators configured to determine a magnitude estimate for each of the separate channel bands.

3.   The narrowband interference cancellation system of claim 2 wherein the plurality of magnitude estimators are coupled to a plurality of short term integrators configured to determine an average magnitude associated with each of the separate channel bands.

4.   The narrowband interference cancellation system of claim 1 wherein the soft decision metric generator produces one or more of a center frequency metric and a stopband attenuation metric for use by the filter component, the center frequency metric providing a

center frequency of a narrowband interferer, the stopband attenuation metric providing an amount of stopband attenuation necessary for the narrowband interferer.

5.   The narrowband interference cancellation system of claim 1 wherein the filter component is an adaptive bandpass finite impulse response (FIR) filter with filter taps determined by the soft decision metric generator.

6.   The narrowband interference cancellation system of claim 1 wherein the filter component is a high pass filter with stopband attenuation determined by the soft decision metric generator.

7.   The narrowband interference cancellation system of claim 5 wherein the soft decision metric generator determines a center frequency and stopband attenuation to enable the adaptive bandpass FIR filter to remove narrowband interference.

8.   The narrowband interference cancellation system of claim 5 further comprising:
        at least one long term integrator coupled to the soft decision metric generator, the
        long term integrator configured to provide an average for any metrics output from
        the soft decision metric generator, the long term integrator.

9.   The narrowband interference cancellation system of claim 8 wherein the long term integrator operates the metrics output from the soft decision metric generator to avoid rapid changes in the coefficients to be used in adaptive bandpass FIR filters.

10.   The narrowband interference cancellation system of claim 1 further comprising one or more filter coefficient storage components coupled to the filter component, the filter coefficient storage components providing filter coefficients for the filter component.

11.   The narrowband interference cancellation system of claim 10 wherein the one or more filter coefficient storage components include one or more look up tables.

12. The narrowband interference cancellation system of claim 1 further comprising one or more coefficient generation components coupled to the filter component, the coefficient generation component dynamically generating filter coefficients for the filter component using one or more known signal processing methods.

13. The narrowband interference cancellation system of claim 12 wherein the known signal processing method includes minimizing a mean-squared error method.

14. The narrowband interference cancellation system of claim 1 further comprising one or more look up tables coupled to the filter component, the look up tables providing tables of filter coefficients for the filter component.

15. The narrowband interference cancellation system of claim 1 further comprising one or more look up tables coupled to the filter component, the look up tables providing tables for providing a center tap for the filter component.

16. The narrowband interference cancellation system of claim 1 wherein the soft decision metric generator is configured to produce a center frequency adjust soft metric, the center frequency adjust soft metric providing a center frequency for a narrowband subject to interference thereby enabling the filter component to filter the narrowband interference.

17. The narrowband interference cancellation system of claim 16 wherein the soft decision metric generator includes a multi-bit comparator configured to determine which frequency band has a maximum average magnitude and output an index identifying the frequency band with a maximum average interference.

18. The narrowband interference cancellation system of claim 1 wherein the soft decision metric generator includes a normalization component that normalizes a total on-

channel signal magnitude parameter with an interference magnitude parameter and produces an output that provides an amount by which stopband attenuation is necessary.

19.   The narrowband interference cancellation system of claim 1 wherein the wide band processing component includes a magnitude estimator and a short term integrator, the magnitude estimator configured to determine the magnitude of the total in-channel received signal, the short term integrator providing an average magnitude to provide to the soft decision metric generator.

20.   The narrowband interference cancellation system of claim 1 wherein the type of interference cancelled includes second order intermodulation distortion (IMD2), third order intermodulation distortion (IMD3), Advanced Mobile Phone System (AMPS) interference, Global System for Mobile Communications (GSM) interference and Enhanced Data for GSM Evolution (EDGE) interference.

21.   The narrowband interference cancellation system of claim 1 wherein the filter component includes at least two adaptive finite impulse response (FIR) filters configured to receive soft metrics from the soft decision metric generator.

22.   A method for canceling narrowband interference in a wide bandwidth receiver, the method comprising:

    receiving an in-channel signal, the signal including quadrature and real signal components;

    filtering the signal in one or more filter banks, the filter banks separating the signal into a plurality of narrowband signals;

    identifying at least one of the plurality of narrowband signals as subject to interference;

generating one or more metrics to enable dynamic alteration of characteristics for

filtering the identified narrowband signal; and

filtering the identified narrowband signal.

23. The method of claim 22 wherein the identifying the plurality of narrowband signals further comprises:

determining a result of applying a function of magnitude to each of the narrowband signals; and

determining an average of the results for the plurality of narrowband signals using a plurality of short term integrators.

24. The method of claim 23 wherein the function of magnitude is one or more of the magnitude and a magnitude squared function.

25. The method of claim 23 wherein the short term integrators detect any high slew rate narrowband interferers.

26. The method of claim 22 wherein the generating metrics is performed by a soft metric decision generator configured to receive one or more thresholds and provide a soft stopband attenuation metric and a center frequency metric.

27. The method of claim 22 wherein the plurality of narrowbands are received by a plurality of magnitude estimators configured to determine a magnitude estimate for each of the separate narrowband signals.

28. The method of claim 22 wherein the metrics are generated in a soft decision metric generator that is coupled to receive an average magnitude associated with each of the separate narrowband signals.

29. The method of claim 28 wherein the soft decision metric generator is coupled to receive the average magnitudes from a plurality of short term integrators configured to determine an average magnitude associated with each of the narrowband signals.

30. The method of claim 28 wherein the soft decision metric generator produces one or more of a center frequency metric and a stopband attenuation metric for use by an adaptive bandpass FIR filter to perform the filtering, the center frequency metric providing a center frequency of a narrowband interferer, the stopband attenuation metric providing an amount of stopband attenuation necessary for the narrowband interferer.

31. The method of claim 28 wherein filter taps for filtering are determined by the soft decision metric generator.

32. The method of claim 28 further comprising:

averaging an output of the soft decision metric generator in a long term integrator configured to provide an average for any metrics output from the soft decision metric generator.

33. The method of claim 32 wherein the long term integrator operates on metrics output from the soft decision metric generator to avoid rapid changes in coefficients to be used in adaptive bandpass FIR filters.

34. The method of claim 28 further comprising:

receiving metrics from the soft decision metric generator in one or more look up tables, the look up tables determining appropriate filter coefficients to enable filtering to remove narrowband interference.

35. A digital signal processor having digital hardware to perform acts for removing narrowband interference, the acts comprising:

receiving an in-channel signal, the signal including quadrature and real signal

components;

filtering the signal in one or more filter banks, the filter banks separating the signal

into a plurality of narrowband signals;

identifying at least one of the plurality of narrowband signals as subject to

interference;

generating one or more metrics to enable dynamic alteration of characteristics for

filtering the identified narrowband signal; and

filtering the identified narrowband signal.

36. The digital signal processor of claim 35 wherein the acts further comprise:

determining a result of applying a function of magnitude to each of the narrowband

signals; and

determining an average of the results for the plurality of narrowband signals using a

plurality of short term integrators.

37. The digital signal processor of claim 35 wherein the generating metrics is performed

by a soft metric decision generator configured to receive one or more thresholds and

provide a soft stopband attenuation metric and a center frequency metric.

38. The digital signal processor of claim 35 wherein the filtering is performed by one of

a high pass filter or a band pass filter, the high pass filter operable when the narrowband

interference is a low frequency interferer.

39. The digital signal processor of claim 35 wherein the metrics are generated in a soft

decision metric generator that is coupled to receive an average magnitude or function of

magnitude associated with each of the separate narrowband signals and an average

magnitude or function of magnitude associated with a total in-channel received signal, the

average magnitudes or functions of magnitude determined at least in part by a plurality of

short term integrators, the soft decision metric generator producing one or more of a center

frequency metric and a stopband attenuation metric for use by one of an adaptive bandpass

FIR filter or a high pass filter to perform the filtering, the center frequency metric providing

a center frequency of a narrowband interferer, the stopband attenuation metric providing an

amount of stopband attenuation necessary for the narrowband interferer.

40.   The digital signal processor of claim 35 wherein the metrics are generated in a soft

decision metric generator that is coupled to receive an average magnitude or function of

magnitude associated with each of the separate narrowband signals and an average

magnitude or function of magnitude associated with a total in-channel received signal, the

average magnitudes determined at least in part by a plurality of short term integrators, the

soft decision metric generator producing a stopband attenuation metric for use by a

bandpass IIR filter to perform the filtering, the stopband attenuation metric providing an

amount of stopband attenuation necessary for the narrowband interferer.